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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,334	03/04/2002	Taiko Motoi	03500.014088.1	8736

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EXAMINER

DONG, DALEI

ART UNIT	PAPER NUMBER
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2875

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/086,334	Applicant(s) MOTOI ET AL.	
	Examiner Dalei Dong	Art Unit 2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 14 and 19-21 is/are rejected.
- 7) ☒ Claim(s) 15-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/086,334.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

2. Claim 20 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 19. See MPEP § 608.01(n). Accordingly, the claim 20 has not been further treated on the merits.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 13-14 and 19-21 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,184,610 to Shibata in view of U.S. Patent No. 6,147,449 to Iwasaki.

Regarding to claims 13-14 and 19-21, Shibata discloses in Figure 21A, a electron emitting device comprising "a substrate 1, a pair of device electrodes 2 and 3 and an electroconductive film 4 which was covered by a metal oxide coat 6 made mainly of

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MgO. Carbon 7 was deposited on and around the electron-emitting region as a result of an activation process. Note that, in FIG. 21A, the carbon 7 do not completely cover the metal oxide coat 6 and the surface of the metal oxide coat 6 is randomly exposed at a number of different areas” (column 29, line 10-17).

Shibata also discloses in Figure 21A, “when tested as the device of Example 1, the emission current I_e of the device of this example showed little change with time. After the experiment, the electron-emitting region of the electron-emitting device was observed through a SEM to obtain a result similar to that of Example 1” (column 29, line 18-22).

Shibata further discloses in Figure 21A, “as in the case of Example 1, apart from the above devices, devices were prepared with metal oxide coats having respective thicknesses of 0.5, 1, 3.5, 5, 10, 20 and 30 nm and subjected to a similar experiment. The device with a 30 nm thick metal oxide coat showed only a low level of I_e . The device with a 20 nm thick metal oxide coat showed a level of I_e that was about a half of that of I_e of the device of this example. The devices with 1, 3.5, 5 and 10 nm thick metal oxide coats operated substantially same as the device of this example. The device with a 0.5 nm thick metal oxide did not show any significant effect of suppressing the change with time of I_e ” (column 29, line 24-35).

Shibata further yet discloses in Figure 21A, “additionally, devices were prepared by using in combination Pd, Ni, Pt and Au films formed by sputtering for the electroconductive film 4 and $\text{Al}_{0.2}\text{O}_{0.3}$, $\text{Y}_{0.2}\text{O}_{0.3}$ and $\text{ZrO}_{0.2}$ formed

either by electron beam evaporation or CVD for the metal oxide coat 6 and their performances were observed to obtain similar results” (column 29, line 36-41).

However, Shibata does not disclose a voltage applier applies a potential great than a potential of the second electrode to said first electrode. Iwasaki teaches in Figures 13A to 13C, “As a result of the observation by SEM, it was confirmed that the coating film of W was formed on the high potential (positive electrode) side of the electron-emitting fissure for both the devices of Examples 1 and 2, as depicted in FIG. 13A. On the low potential (negative electrode) side, no appreciable coating film was found. For some of the devices fabricated under conditions similar to those in this Example, a slight coating film was also found on the low potential side depending on the conditions, as depicted in FIG. 13C” (column 19, lines 49-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have manufacture the carbon film coating of Shibata according to the configuration of Iwasaki in order to provide a stable characteristics of electron emission and also has improved efficiency of electron emission and maintain excellent stability during operation.

Allowable Subject Matter

5. Claims 15-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter: The prior art of record taken alone or in combination fails to teach or suggest a electron-emitting device wherein the surface of the substrate is concaved at section within the gap and the concaved substrate contains carbon in order to obtain a configuration of a surface conduction electron-emitting device capable of implementing good electron emission characteristics (electron emission efficiency) and high-luminance display over a long time, and an electron source using the devices, and an image-forming apparatus using it.

Response to Arguments

6. Applicant's arguments with respect to claims 13-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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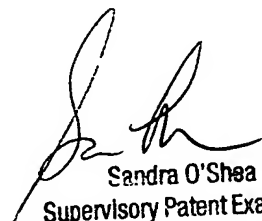
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
September 3, 2003



Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800